REMARKS

Claim status

Claims 1-6 and 8-17 were pending at the time of the outstanding Office action. Claims 7 and 18 have been previously cancelled. Claims 1 and 9 are currently amended herein. Claims 4-6, 8, and 11-17 are cancelled herein. Claims 1-3 and 9-10 are currently pending in the application.

Objections to the Claims

In the current Office action, claim 1 is objected to because of an informality pointed out by the Examiner.

Applicants respectfully traverse the foregoing rejections in view of the above pending claims and for reasons set forth hereafter.

Applicants have amended claim 1 herein to comply with the Examiner's recommended language being, "…a transformation unit which is designed to carry out transformation of the physiological signal in such a way that it outputs a number of values representing the physiological signal and based on the transformation…".

Applicants respectfully request that the objections to the claims be removed.

Section 112 rejections

In the current Office action, claims 1-6 and 8-17 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement.

In the current Office action, claims 1-6 and 8-17 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement.

The Examiner takes exception to the claim language, "a transformation unit which is designed to carry out transformation of the physiological signal in such a way that it outputs a number of values representing the physiological signal and based on the transformation", in that

the Examiner states that no processor, memory, or machine readable medium is described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed transformation unit designed to carry out transformation of a physiological signal, and to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the transformation unit designed to carry out transformation of a physiological signal.

Applicants respectfully traverse the foregoing rejections in view of the above pending claims and for reasons set forth hereafter.

Fig. 1 of the present application clearly shows the transformation unit 3 including a computing unit 4 and a wavelet store 6. It would be clear to one skilled in the art that a computing unit 4 would include a software programmable processor or a hardware programmable logic and/or memory, and it would further be clear to one skilled in the art that the wavelet store 6 would include memory.

Furthermore, paragraphs [0032] to [0034] of the present application state, "For carrying out the wavelet transformation operation the transformation unit 3 includes a wavelet store 6 in which the reference wavelets are stored and a computing unit 4 which is connected to the adjusting/standardizing stage 28 for receiving the event signal standardized and centered in the window and to the wavelet store 6 for receiving the reference wavelets. Calculation of the coefficients, that is to say the actual wavelet transformation operation, takes place in the computing unit 4. There are a number of calculation methods which are suitable for calculation of wavelet transformation. Equally there are a large number of suitable reference wavelets. For calculation of wavelet transformation in the computing unit 4, it is possible to select the set of reference wavelets used, for example having regard to the computing power which can be achieved. When selecting the calculation method and the reference wavelets however care is preferably to be taken to ensure that, when calculating wavelet transformation in the computing unit 4, the same calculation method and the same set of reference wavelets are used as are employed when calculating the comparative coefficients (see hereinafter). The computing unit 4 outputs the result of wavelet transformation, that is to say the wavelet transformation

coefficients, as a set of coefficients, to the probabilistic neural network 5 (abbreviated hereinafter to PNN)."

Therefore, it is clear that the specification of the present application clearly describes the transformation unit 3 in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed transformation unit designed to carry out transformation of a physiological signal, and to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the transformation unit designed to carry out transformation of a physiological signal.

Applicants respectfully request that the rejection of claims 1-6 and 8-17 under 35 U.S.C. 112, first paragraph, be removed.

Section 101 rejections

In the current Office action, claims 1-6 and 8-17 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. In the outstanding Office action, the Examiner states that the transformation unit is considered to be a non-functional description or software per se.

Applicants respectfully traverse the foregoing rejections in view of the above pending claims and for reasons set forth hereafter.

Again, Fig. 1 of the present application clearly shows the transformation unit 3 including a computing unit 4 and a wavelet store 6. It would be clear to one skilled in the art that a computing unit 4 would include a software programmable processor or a hardware programmable logic and/or memory, and it would further be clear to one skilled in the art that the wavelet store 6 would include memory.

Furthermore, paragraph [0031] of the present application states, "The transformation unit 3 executes wavelet transformation of the centered and standardized event signal, the result of the transformation operation being a number of coefficients representative of the signal. Wavelet transformation is a well-known method of compactly representing any signals (emphasis added).

Ser. No. 10/674,270   - 8 -
Response to Office Action of 11-5-08
Atty Docket 117163.00092

In that case, the transformation of a signal is effected by means of reference wavelets and a calculation procedure which specifies how the reference wavelets are to be calculated with the signal. Details of the transformation can be selected within the mathematical limits given by the calculation environment, in such a way that it can be highly effectively used for given signal classes. In the present embodiment which is intended for use in an implantable medical device, wavelet transformation makes it possible to represent an event window with a window width of 64 sampling steps (64-coefficient DWT) with fewer than 16 wavelet transformation coefficients and at the same time obtain sufficient information in respect of the signal, to guarantee reliable event classification in the probabilistic neural network 5."

The physiological signal is representative of a physiological event and the transformation unit 3 operates on the physiological signal in a very particular way, via the computing unit 4 and the wavelet store 6, to generate values representing the physiological signal.

Therefore, it is clear that the transformation unit of independent claim 1 constitutes statutory subject matter under 35 U.S.C. 101. Furthermore, other elements of independent claim 1, such as the signal preparation unit, also constitute statutory subject matter, as admitted by the Examiner.

Applicants respectfully request that the rejection of claims 1-6 and 8-17 under 35 U.S.C. 101 be removed.

Section 103 rejections

In the current Office action, claims 1-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Esteller (US 6,594,524), hereinafter Esteller, in view of Gillberg (US 6,393,316), hereinafter Gillberg.

Applicants respectfully traverse the foregoing rejections in view of the above pending claims and for reasons set forth hereafter.

It is respectfully submitted that neither Esteller, Gillberg, nor the combination thereof teach, suggest, or render obvious the claimed invention of independent claim 1. The apparatus of

claim 1 comprises an ascertaining unit and a selection unit that conduct a comparison of and a selection from a plurality of comparative values, wherein the comparative values represent different offsets with respect to the centering of the signal in the time window. Thus, the negative effect of even a slight de-centering of the physiological signal in the time window is eliminated or at least minimized, because the probabilistic neural network generates association probabilities even for those comparative values that represent an offset physiological signal. Offset physiological signals, thus, lead to association probabilities that can be processed by the selection unit. The selection unit, in turn, is able to assign a physiological signal to the correct event class, even if the physiological signal is offset with respect to the time window. This is neither disclosed nor suggested by any of Esteller, Gillberg, nor the combination thereof. Therefore, for at least these reasons, no prima facie case of obviousness has been set forth in the Office action and claim 1 is patentably distinct from the proposed combination.

Therefore, in view of at least the foregoing, it is respectfully submitted that independent claim 1 defines allowable subject matter. Furthermore, since claims 2-3 depend either directly or indirectly from independent claim 1, it is respectfully submitted that claims 2-3 define allowable subject matter as well. Applicants respectfully request that the rejection of claims 1-3 under 35 U.S.C. 103(a) be removed.

In the current Office action, claims 4-6, 8, 9, and 11-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Esteller in view of Gillberg and further in view of Echauz et al. (US Patent No. 6,678,548), hereinafter Echauz.

Applicants respectfully traverse the foregoing rejections in view of the above pending claims and for reasons set forth hereafter.
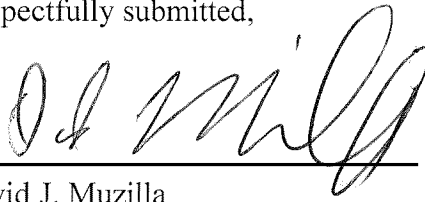
As described above, neither Esteller, Gillberg, nor the combination thereof teach, suggest, or render obvious the claimed invention of independent claim 1. Furthermore, neither Esteller, Gillberg, Echauz, nor the combination thereof teach, suggest, or render obvious the claimed invention of claim 1. Also, claims 4-6, 8, and 11-17 are cancelled herein.

Therefore, in view of at least the foregoing and the fact that claim 9 depends from independent claim 1, it is respectfully submitted that claim 9 defines allowable subject matter as well.

Applicants respectfully request that the rejection of claims 4-6, 8, 9, and 11-17 under 35 U.S.C. 103(a) be removed.

Accordingly, the applicant respectfully requests reconsideration of the rejections and objections based on at least the foregoing. After such reconsideration, it is urged that allowance of claims 1-3 and 9-10 will be in order.

Respectfully submitted,

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